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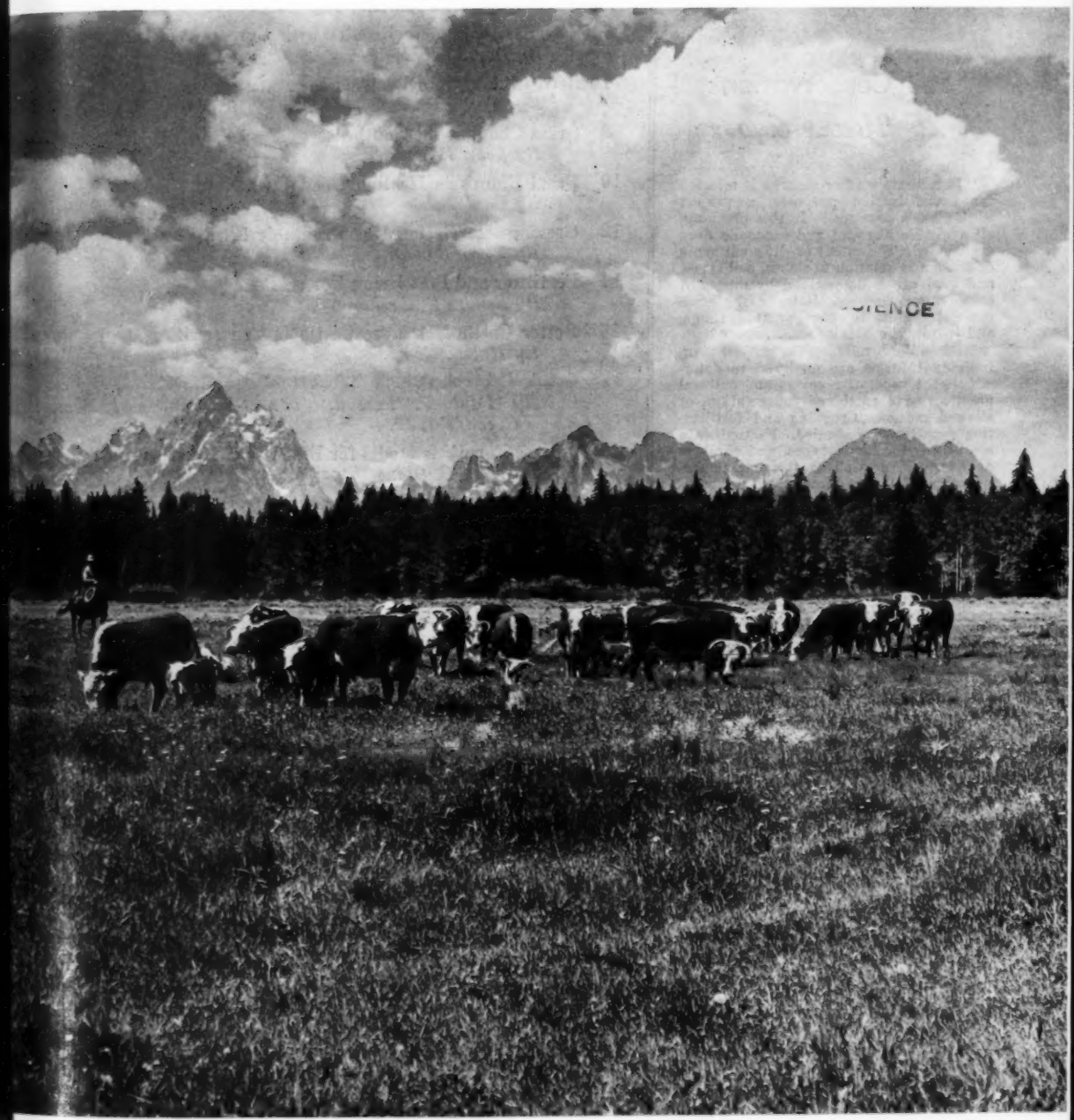
AUGUST 1963

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

Soil Conservation
25 Years Ago

"Immediately after an area is selected for demonstration purposes, a project work plan is developed. In this planning, all available physical and economic data are studied. The extent of different types of erosion in relation to slopes, soil types, and land use is determined by means of conservation surveys. Data on the land-use distribution to crops, pasture, range, and woods, are obtained. . . .

"Often, in developing the project plan, individual farms are analyzed to determine what vegetative covers and cultural practices have furthered conservation, or allowed erosion. Cropping and fertilization practices are studied. Factual data concerning the kinds, types, and numbers of livestock, as well as the market distribution of livestock and their products, are considered. In this field, the dominating feeding and grazing practices are important. And once each distinct factor is considered in the light of other related factors, and all the information synthesized, a basis is obtained for the development of sound and coordinated project plans."

COVER PICTURE.—Grass and livestock like these purebred Hereford cattle on Elk Ranch in Teton County, Wyo., add up to big dividends from conservation farming and ranching the country over. —Photo by B. C. McLean

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Soil Conservation

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FRANK B. HARPER, Editor

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TECHNOLOGY & SCIENCE

Watershed Land Treatment Boosts Community Income

By G. Claire Herting and I. B. Stafford

Schoolhouse where first meeting of Great Brook Conservation Co-operative was held. (l. to r.): G. Claire Herting, SCS; Thomas Boyce, who started cooperative; Mortimer Brooks.

CONSERVATION land use centered on improved pasture and hay production is continuing to pay off for dairy farmers and the whole community in the Great Brook watershed of Chenango County in central New York.

Great Brook was No. 1 on the list of 60 "pilot" projects selected in August 1953 for local-State-Federal treatment like that now being carried out extensively over the country through the Watershed Protection and Flood Prevention Act. Although the project formally was completed in 1958, consisting principally of land-treatment conservation measures on the 16,000-acre project's cropland, grassland, and woodland, landowners in the 99 percent privately owned watershed have continued to maintain and expand the conservation work on their lands. Most of the farmers try to improve a few more acres each year.

Their rewards are evident, on the land and in the bank. The conservation treated hillsides and level areas alike were green this past spring, even though the areas were in need of water. In contrast, the few unimproved pasture fields were brown, with no green grass visible. The streams now run clear, because most of the land in the watershed is covered with grass or trees, and the water soaking into the soil in the grassed areas feeds the growing crops and the springs instead of causing erosion and silting.

Officers of the Great Brook Conservation Co-operators, organized to interest everybody in the watershed and the community in the program, estimate that the average yearly increase in total income because of the improved hay and pasture production is more than $3,000 a farm. This increase is possible because the cattle are producing milk at lower cost. This income, in turn, is reflected in improved business for the local feed and fertilizer, seed, farm implement, gas and oil, automobile, hardware and lumber, and other dealers, as well as for the grocery, clothing, drug, and other merchants. The combined benefits to landowners and businesses attest to the watershed development's value as a successful community project.

A sign by the side of the road reads: "Great Brook Watershed"; but what the sign doesn't say is how the people of the valley, through their own efforts in conservation of their soil and water, reversed a trend that had threaten-

Land seeded for improved pasture and farm ponds on Mortimer Brooks (l.) and Orville Alsip (r.) farms in Great Brook watershed.

The authors are work unit conservationist, Norwich, and State conservationist, Syracuse, both of the Soil Conservation Service, N. Y.

ed the communities of South New Berlin and Holmesville. It doesn't tell about floodwater damage to highways and bridges, silting of bottom lands, or sheet and gully erosion on hill land.

Extension of credit was tight in Southern Tier counties, especially for hill farmers who owned most of the farms in the Great Brook watershed. Dairy farming, the leading industry, had been slipping since World War II. The landowners decided in the fall of 1952 that something must be done.

The first of a number of group meetings of watershed farmers was held in October, to find out if the landowners were interested in the benefits the soil conservation program had to offer. Chairman Anson White of the Chenango Soil Conservation District directors explained how the district could furnish technical assistance and help cooperators obtain machinery necessary to establish practices called for in a basic conservation plan for each cooperator's farm. He also told the farmers how a watershed program would help them to raise better crops and produce milk at lower cost, and consequently have more money with which to buy new machinery and other items, repair their farm buildings, pay taxes, and support their churches.

A Soil Conservation Service technician explained soils maps and how the soils affect crops. Dates were set up for SCS technicians to visit each farm and help the farmer go as far as he wanted to go at the time with his conservation plan.

All landowners in the watershed were given an opportunity at such group meetings to learn about the program starting in the Great Brook watershed; and after a few weeks 95 percent of them had become Chenango County district cooperators. Twenty-six groups were represented at a community meeting in Norwich to enlist the cooperation of bankers; feed, fertilizer, and seed dealers; machinery dealers; town and county governments, Federal and State agencies; clubs, and individuals interested in agriculture.

Field days and tours, sponsored by the Unadilla Valley Grange in South New Berlin and by Boy Scout troops and 4-H clubs, both before and after the watershed project was designated on August 14, generated widespread interest in the conservation activities already under way by the spring of 1953. These included pastureland improvement, tree and wildlife shrub plantings, farm pond and wildlife marsh development, and other practices, for which additional Agricultural Conservation Program funds were allotted.

A Brooks pasture before brush was removed.

Through the project, technical assistance was provided by the SCS and the U. S. Forest Service. Little by little, a few acres at a time, the farmers themselves accumulated sufficient funds to improve pasture, the most necessary item in their farming program. As each acre was improved, it brought in more funds to improve more acres. Soon money was available to construct farm ponds, diversion ditches, protected outlets, and other essential farm conservation measures.

Today, you will hear the story of satisfying results from one end of the watershed to the other. As Mortimer Brooks, who has improved more than 75 acres of pasture on his farm, says:

"These improved pastures give me a better milk yield even in the middle of the summer. That's the difference between profit and loss to me. All this has cost me money, but it is paying off now. Under the present conditions in farming, no one can afford not to improve his pastures if he wants to stay in farming."

Others who share Brooks' opinion include: Neighbor Orville Alsip, who won the Master Conservation Farmer Award with Mrs. Alsip in

Cyrus Pike's cows thrive on birdsfoot trefoil and timothy pasture on area cleared of brush.

1962; Kenneth Herman, a director in the organization since it was started and winner of the 1960 Excellent Farmer - Conservation Award; President Cyrus Pike of the Great Brook Watershed Conservation Co-operators and 1960 Master Conservation Farmer Award winner; Gerdt Treschow, who has planted more than 100,000 trees on his land; and Past President Walter Whitney who says his stripcropping, ponds, and other conservation measures all pay for themselves and that "I make more money than I used to, so I have more to put back into the farm."

Others include Alf Benson, who credits his pasture improvement and diversion ditches with having helped him to pay his mortgage by producing milk at a lower cost than before the watershed program was started.

Other aspects of the conservation program have not been overlooked. Most farms have one or more ponds to provide water for the cattle. They also are used for swimming, boating, and fishing. Many of the landowners have planted shrubs in odd corners of their land to provide food and protection for the wildlife. Woodland has been fenced to keep cattle out.

These and other measures mark the continuing progress of the conservation land treatment program in the Great Brook watershed.

Utah Rancher Gets Results With Conservation Program

By Donald H. Fulton

EXPERIENCE has borne out the soundness of Utah rancher Bill Karren's decision in 1957 to improve the land he already had at Jensen through reseeding and other conservation measures instead of buying more rangeland.

It was one or the other, because his cows were coming off the summer range in poor condition and with light calves. Karren figures it would have cost at least $10 an acre for land equivalent to his own; whereas it costs him only $10 an acre to reseed, and the reseeded range will run 10 times more livestock on an acreage basis and produce heavier calves. Since he started his conservation program, his calves have increased 75 pounds in weight, and the percent of calf crop for the breeding cows is better than 90 percent.

With the help of a Soil Conservation Service range conservationist, Karren first made an inventory of his range and developed a conservation plan through the Uintah Basin Soil Conservation District, with Agricultural Conservation Program cost-sharing assistance. The plan included dividing the 4,000-acre ranch into four pastures so good grazing management could be achieved. Then in the spring of 1958 he plowed up the big sagebrush and drilled in crested wheatgrass and Ladak alfalfa on an 85-acre area in the north pasture that was in poor condition.

Clippings made on June 14, 1960, showed that the seeded area was now producing 1,400 pounds of crested wheatgrass and alfalfa

Karren compares seeded pasture to his right with native range and its sparse grass stand under big sagebrush.

The author is range conservationist, Soil Conservation Service, Roosevelt, Utah.

Tank Karren made from old dump truck to hold stockwater piped 1½ miles from mountain spring.

(air-dry weight) to the acre, while adjacent areas in native plant cover were producing only 397 pounds of total air-dry herbage an acre, and 248 pounds of this was big sagebrush unpalatable to cattle. Actually, then, only 70 pounds of this native vegetation an acre could be taken by cattle for proper, or 50 percent, grazing use; whereas on the seeded land 700 pounds of forage an acre were available for proper use of taking half and leaving half. The difference thus was 10 times, or 1,000 percent, more usable forage on the improved acreage than on the undeveloped range.

"When I turned the cows on the crested wheat, I could see them start to put on weight," Karren recalled in explaining his plans to put an electric fence around the 85-acre seeded area and seed the rest of the pasture, an additional 200 acres, to crested wheatgrass.

Range reseeding is only part of Karren's ranch conservation program. Since 1957, he has deferred or rested one of his four pastures from grazing through the plant growing season each year and rotates the grazing in the other three. This system allows the native grasses to seed, and gives young grass seedlings a chance to get established.

He also has made plans for sagebrush control with a spraying program on 3,000 acres, further to increase palatable grasses and the livestock carrying capacity, and provide better erosion control. Meanwhile, with the help of Bob Metcalf, his father-in-law, Karren has installed approximately 3 miles of plastic pipe that carries water from springs on the hillsides to pasture areas that did not have livestock water, constructed four earth ponds, and built and repaired 4 miles of fence.

Karren always has time to show visitors one of his better calves resulting from range conservation program.

Karren's 200 acres of irrigated land at Jensen also has a new look. He has developed new irrigation systems by leveling his fields and constructing new ditches, so he now has control of his irrigation water. He also installed an 8-inch, ½-mile-long pipeline from the main canal on the hill above his fields to the Green River below. When there is enough water in the canal, he can sprinkler irrigate with gravity pressure, and when water is low in the canal, can pump water from the river through the same system.

"I now go on my mountain range 2 weeks later in the spring and bring them off when the range has been properly grazed," Karren says of his conservation program. "I have plenty of feed on the farm, and this way I can improve my range faster. I am glad I made that decision in 1957. Even though the past 3 years have been extra dry, the grass has still improved and I have sold good calves. I only wish I had started my conservation program earlier."

Karren was selected as outstanding farmer in 1961 by supervisors of the Uintah Basin district, and as outstanding farmer of the year 1962 by the Utah Association of Soil Conservation Districts.

Grass close to a pond is shown in fall before Karren moved cattle off mountain range to graze crop aftermath on irrigated fields.

Reed Canarygrass Protects Iowa Watershed Structures

By Wallis R. Tonsfeldt

A SO-CALLED "haying method" of planting Reed canarygrass has been responsible for many of the stands that today protect a high percentage of the floodwater retarding structures in Iowa's Little Sioux watershed flood prevention project from damaging erosion by wave action.

About half of the 240 structures in the 50 completed subwatersheds in the Little Sioux watershed already have a Reed canarygrass border along the waterline. By controlling wave-action erosion, landowners and Soil Conservation Service technicians helping in the watershed work have found, annual maintenance costs are decreased considerably.

Formerly, stands of Reed canarygrass generally were established by sprigging or seeding; but, because the soil where the grass grows best often is too wet for operating planting equipment, a better way was needed. Finally, a few years ago, Nature showed the conservationists another way to do this job.

It happened on the Garton subwatershed, between Cherokee and Sioux Rapids, where the structural work had just been completed. Wayne Casey, a commissioner of the Buena Vista County Soil Conservation District, had just finished mowing a waterway of Reed canarygrass above one of the impoundments when a heavy rain washed the freshly cut grass into the pond below. Wind and waves then carried the grass ashore, where it took root from the joints and grew into a good, protective border for the pond.

Today, plantings of Reed canarygrass conventionally are made

Planting Reed canarygrass by haying method.

in much the same manner in other places. The grass is cut, between about June 15 and September 15, from an established area and hauled to the pond edge. It then is spread over the area above the waterline with a fork and tramped into the wet ground. It is essential that the cut grass has joints, because the new roots grow from them. The best planting time is when the ground is too wet for fieldwork.

Another method used is seeding waterways by hand early in the spring. The seed is placed on top of the ground, where freezing and thawing action work the seed into the soil. This method has been used satisfactorily for the last 4 years or so in the Little Sioux. But the haying method is used primarily for establishing plantings around water impoundment areas, because the wave action is too rough on small plants growing from seed.

Reed canarygrass covers shoreline of pond on Jack Meeves property in Lum Hollow subwatershed near Smithland, Iowa.

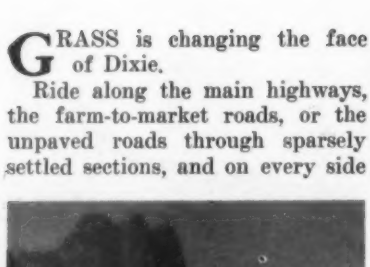
The author is soil conservationist, Soil Conservation Service, Sioux City, Iowa.

GRASS CHANGES THE SOUTHEAST

By Leon J. Sisk

GRASS is changing the face of Dixie.

Ride along the main highways, the farm-to-market roads, or the unpaved roads through sparsely settled sections, and on every side evidence of the change is apparent. Where gullied, wornout cottonfields and wet, "corned to death" bottom lands once met the eye are verdant areas of lush grasses that bind the soil against erosion and help to build it up to produce better livestock and other crops.



Bennett with Coastal bermudagrass he has grown on steep land.

J. F. Strickland of Mershon, Ga., averages 2,300 pounds of tobacco an acre grown after Coastal bermudagrass, compared to only 1,250 pounds before he used rotation.

The answer to what's behind this revolutionary change to grass—after decades of fighting Johnson grass, particularly—can be summed up in one word—profit. In the words of a North Carolina soil conservation district farmer: "Whether you're running beef cattle, operating a dairy, or growing cash crops, grass will make your operation more profitable."

When planted in a grass-based rotation, the experience of farmer after farmer has shown any cultivated crop is better in both quality and quantity. The rotation of grass with the crops in a sense means "resting" or re-invigorating the land, with the land usually in grass for 3 years and then cropped for 1 year, preferably, but not more than 2 years.

The three grasses most widely used in the South are Coastal bermudagrass, Pensacola bahiagrass, and Kentucky 31 fescue. They top the list of grasses used by Soil Conservation Service technicians in helping farmers with conservation farm planning and land treatment. The tall fescue, for example, performs spectacularly in grass-based rotations.

"As long as I'm where there is some fescue, that's where I want to plant my tobacco," one North Carolina farmer says.

Last year, this farmer received $1,698 an acre for tobacco that followed 2-year-old fescue, and only $1,140 an acre for tobacco on the rest of the field.

Fescue was probably the first grass to be used in a sod-based rotation in the Southeast, but now the Bermudas—Coastal and common—and bahiagrass all are being widely used. No accurate estimate can be made of the acreage in grass in the Southeast, but it is generally believed that there are between 4 and 5 million acres in bahiagrass, about the same in the Bermudas, and at least a million acres in fescue.

Bahiagrass has captured the imagination of farmers and soil conservationists in the deep South. In Spanish, Bahia means "bay," but in this region Bahia means a dependable, moneymaking grass that will grow on difficult sites, that can be seeded successfully under severe conditions, and that will persist and maintain itself with a minimum of proper management.

An Alabama farmer applied 400 pounds of 0-14-14 to 12 acres of bahiagrass in the spring and grazed the field until the first of June. He then took the cattle off and topdressed with 150 pounds of liquid nitrogen to the acre, and still was able to harvest more than a ton of seed and 932 bales of hay. A Mississippi Delta farmer says: "Bahia will carry more cattle and still produce more hay than any grass I have ever seen in my 35 years of farming."

Coastal bermuda is another perennial grass that has been widely planted across the face of Dixie to supply grazing during the hot, dry Southern summers when fescue is more or less dormant. Besides providing large amounts of good grazing, Coastal bermuda also makes topnotch feed as hay, silage, or

The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

green chop. The key to good growth is plenty of fertilizer (2-1-1 ratio), especially nitrogen, and plenty of water.

In a dry season, with the help of irrigation, 15 acres on a Louisiana farm (after a topdressing with 100 pounds of ammonium nitrate) carried 82 head of cattle from June until late fall and still produced 70 bales of hay an acre. It also is a matter of record that 12,000 pounds of Coastal bermuda hay have been cut from a single acre, and even higher yields have been reported. Clemson Agricultural College's Edisto Experiment Station reports beef cattle gains at a little more than 1,000 pounds an acre from Coastal bermuda fertilized with 400 pounds of actual nitrogen.

The use of grass in pastures and in cropping systems is showing up favorably meanwhile in the conservation of soil and water. Three-year-old fescue turned under will add from 10 to 16 tons of residue an acre to the soil. This is also true of the other grasses to a greater or lesser degree. This large amount of material added to the soil makes it mellow and absorptive and lets most of the rainfall soak in instead of running off.

Many Southeastern rivers still run red with the life blood of the soil, but in recent years grass has kept much soil out of the rivers and on the farms where it belongs. Thus the growing of fescue in the hill country comprising the headwaters of the Chattachoochee River watershed has reduced erosion to such an extent that the river no longer runs yellow. More than 65 percent of the landowners have planted fescue and clover in the six counties above Atlanta where the Chattachoochee rises.

Thus the Southeast during the last few years has launched and is supporting movements tending definitely in the direction of a grassland agriculture. It is this new concept of grass as a crop and for improved pasture that is changing the face of Dixie.

Strips of tall fescue sod protect land from erosion and give easy access to tomatoes for spraying, cultivating, and harvesting on Dave Cameron Farms at York, S. C.

This Coastal bermudagrass hay on farm in South Carolina yielded 3 tons an acre.

Bahiagrass being turned for crops in grass-based rotation on Carroll Sease farm in Lexington (S. C.) SCD.

BASAL PLANTINGS

Healing Road Cuts Nature's Way

By Paul Tabor

Strip of weeping lovegrass at base of roadcut slope with Japanese honeysuckle above.

GEORGIA soil conservationists have borrowed a leaf from Nature's book in developing a new method of protecting bare roadcut banks by establishing native plants at the base of the slopes.

As a result, several miles of cuts on the Silver City-Matt highway in Forsyth County now sport dense bands of weeping lovegrass, alone or in mixture with Sericea lespedeza or tall fescue, just above the road ditches. This is the first step in the new basal-planting method. It imitates the natural process of native plants' establishing themselves at the base of slopes.

The idea of basal plantings was developed by the author and A. C. Veatch, Soil Conservation Service agronomist, now retired. The first plantings were made during the summer of 1958 in the Settingdown Creek subwatershed in the Upper Chattahoochee Soil Conservation District. More plantings were made in this vicinity during 1959. In 1960, similar plantings were made in the Blue Ridge district with active cooperation of its supervisors, the State Highway Department, and SCS employees.

Note:—The author is retired plant materials specialist, Soil Conservation Service, Athens, Ga.

Under favorable conditions, Nature prepares an excellent seedbed by the alternate freezing and thawing of the bare road slopes and the movement of the resulting loose soil material downward by rain.

Soil from roadcut slope accumulated behind basal seeding of weeping lovegrass above road ditch.

For accumulation of this eroded material, the road ditch should be a minimum of 15 to 18 inches from the base of the roadcut slope; and the ditch needs enough stabilization to prevent lowering by gullying. Basal accumulation of the eroded material from the cut slope is enhanced by a decrease of gradient downward in the roadcut slope. It is effectively prevented, on the other hand, by an increase of gradient directly into a road ditch that has enough grade for the loosened soil to be carried away by runoff.

In the humid Southeast, longtime leaching by excess rainfall has reduced the fertility of subsoils to a very low level. To insure good plant growth, lime and commercial fertilizer were broadcast on the loose natural seedbed at the base of roadcut slopes, and covered with hand rakes or drag harrows offset from tractors by improvised hitches. Weeping lovegrass and Sericea lespedeza seed was sowed on the basal strip and covered by a second raking or harrowing. The lime, fertilizer, and seed also can be mixed and sowed on the loose, undisturbed seedbed, and then covered with one raking or harrowing. Adequate mechanical equipment for spreading and covering lime and fertilizer and seed on 2-to-1 or greater slopes has not been available.

A dense band of vegetation established on the basal accumulation of

Roadcut slope completely covered after three successive basal-strip sowings of tall fescue, weeping lovegrass, and Sericea lespedeza.

soil materials just above the road ditch will stop the downward movement of silt and promote a second zone of accumulation above. This, in turn, can be planted to widen the vegetated zone. The entire slope can be vegetated by such successive strip sowings.

A second method being tried for covering the bare slope above the first basal planting is to set Japanese honeysuckle plants in prepared holes at 3-foot intervals. As these plants grow, they will spread and cover the slopes. Repeated fertilization apparently will be needed on most sites.

A third possibility is to wait for natural vegetation of the bare slopes above the initial basal band of established plant cover. Such revegetation has not developed, however, in a three-year trial; and mulching may be needed, in addition to the lime and fertilizer, to speed up the process. Also suggested is planting a row of Sericea lespedeza and weeping lovegrass along the top of the roadcut to produce self-sowed seed for the slope below.

Weeping lovegrass strip at base of slope on Matt-Silver City roadcut.

Basal planting of roadcut slopes is an economical step-by-step method of vegetating short- to medium-length slopes that are not excessively erodible. The cost is spread over two or more years. No artificial seedbed preparation is required. This method has been successful on very steep, short slopes, with grade lessened by erosion above and the accumulation of soil materials in the band of vegetation below. The chief objections are the slowness of vegetating the entire roadcut banks, the hand labor needed, the limitations on highly erodible sites and long slopes, and the care required in road-ditch placement and maintenance.

Experience so far indicates that basal plantings on roadcuts have a place on many secondary highways in the Southeast and probably elsewhere.

3-year-old Japanese honeysuckle basal planting on a U. S. Highway 19 backslope.

Campsites

The University of Michigan Survey Research Center found that recreational facilities should be located within 1 or, at most, 2 days' driving distance from the areas which they are intended to serve. For instance, facilities for people in the Northeast must be located in that part of the country. Some campsites should be located in isolated areas for those people who enjoy solitude and forestry. Other camping facilities should be in larger clusters for social interaction, and others should be provided somewhere between the very isolated and the highly clustered type.

Colorado Grazing Associa

E. Hatcher (l.) and Lail Schmidt, local farm leaders who helped organize Association.

By T. K. Eaman

FORTY east-central Colorado farmers are showing another way for their Great Plains neighbors and others elsewhere in the country to bring about profitable rural area development through locally initiated conservation land use.

They are doing it through the Prowers County Grazing Association they recently formed to enable them to acquire nearly 15,000 acres and develop it through the Great Plains Conservation Program into a profitable grazing area. Approximately 13,500 acres of the new ranch unit is rangeland needing conservation improvement or management, and the rest is marginal wheatland. The Association bought 12,000 acres and took over leases on a total of 2,700 acres of State and private lands.

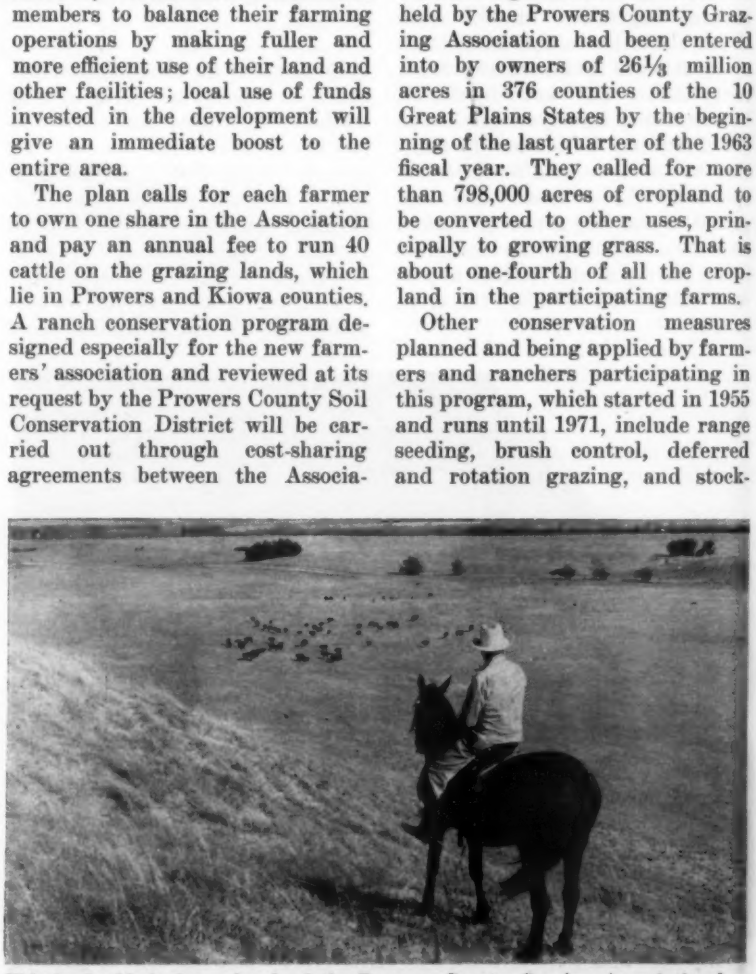
Financing was made possible through a $375,000 loan from the U. S. Department of Agriculture. The first such loan ever made by the Department, it was made in April this year by the Farmers Home Administration under authority of the 1962 Food and Agriculture Act permitting loans to nonprofit associations for shifting land to grazing, forestry, and recreational uses. The loan will bear 4½ percent interest, with repayments scheduled over 40 years.

The Association's organizers estimate that the income of its individual members will be increased by nearly $2,500 a year—bringing an additional $100,000 annually into the area's economy. Thus the new conservation land-use improvement and management undertaking not only will enable Association members to balance their farming operations by making fuller and more efficient use of their land and other facilities; local use of funds invested in the development will give an immediate boost to the entire area.

The plan calls for each farmer to own one share in the Association and pay an annual fee to run 40 cattle on the grazing lands, which lie in Prowers and Kiowa counties. A ranch conservation program designed especially for the new farmers' association and reviewed at its request by the Prowers County Soil Conservation District will be carried out through cost-sharing agreements between the Association and the Federal Government under the Great Plains Conservation Program and the Agricultural Conservation Program, with Soil Conservation Service technical help.

Through the Great Plains Conservation Program, 11,350 such cost-sharing contracts as that now held by the Prowers County Grazing Association had been entered into by owners of 26⅓ million acres in 376 counties of the 10 Great Plains States by the beginning of the last quarter of the 1963 fiscal year. They called for more than 798,000 acres of cropland to be converted to other uses, principally to growing grass. That is about one-fourth of all the cropland in the participating farms.

Other conservation measures planned and being applied by farmers and ranchers participating in this program, which started in 1955 and runs until 1971, include range seeding, brush control, deferred and rotation grazing, and stock-



This is the kind of grazing land the Prowers County Grazing Association has set out to develop.

The author is range conservationist, Soil Conservation Service, Denver, Colo.

Profitable Land-Use Aim

Calves like these will gain weight fast when put on good summer range.

water developments. On croplands, the cost-shared measures include terracing, stripcropping, water spreading, and irrigated land improvements for production of supplemental feed for livestock.

A key part of the new Grazing Association development, similarly, is the installation of a complete conservation plan through the Great Plains Conservation Program, to insure the most effective use of the land, which straddles the Big Sandy River on the Prowers-Kiowa County line. Twenty-four of the Association ranchers already were familiar with such a program, as cooperators with the Prowers and Northern Prowers Soil Conservation districts; but the Association's ranchlands are not in a soil conservation district.

A soil survey of Prowers County has helped with the conservation planning. Soils maps show the kind of soil, land slope, and the nature of erosion. Range sites, land capability, and other information can be obtained from the soil survey. Careful range management is needed on the Association's newly acquired, predominantly sandy lands, in order to keep a good cover of deep-rooted grasses for wind erosion control. The bulk of the land will be developed into top grazing land, which later is counted upon to increase the Association's estimated initial carrying capacity of 1,600 cattle.

This is the system that a member of the grazing association will follow: Calves or short yearling weighing 400 to 500 pounds can be purchased each year and grazed on its ranch from about May 1 to November 1. Credit needed by the farmers to finance their cattle will come mostly from local banks and the Production Credit Association. The Farmers Home Administration, working with local sources of credit, will supplement their lending with additional loans if necessary. Thirty-six farmers started the Association's program off this year when they bought 1,275 cattle and put them on the ranch the first half of June.

The Association's ranch conservation plan shows how the land will be used and how it will be treated for protection from erosion and other hazards. Management guides are set up to provide for the best continued production of grass. Number one among the conservation practices is proper use of the native range grasses.

The ranchers will control grazing to make sure that no more than half of the growth, in weight, of the key grasses will be grazed off each year. Blue grama and western wheatgrass are key grasses on the 2,500-acre loamy plains site. Sand reedgrass, sand bluestem, needle and thread, and side-oats grama are key grasses on the sandy sites. On the 200 acres or so of salt meadow or bottom land along the Big Sandy, alkali sacaton and switchgrass will be the grasses on which management is based.

Seeding native grasses on the 1,440 acres formerly used for dry cropland also is in the Association's conservation plan. Most of this acreage is loamy plains, on which blue grama and western wheatgrass are the two main grasses to be seeded, with bluestems and side-oats grama planted on the sandy sites. Also planned for later on is control of sand sagebrush that covers most of the deep sand site

Association's conservation range operations hinge upon calves like these around windmill on upland range in Prowers County.

and is thick on some of the sandy plains range, competing with desirable grasses for moisture and space.

Association plans are to graze the different kinds of range when the native grasses are most palatable and productive. Deferred grazing will be used. Starting in the spring, the salt meadow will be grazed first. Next, grazing will be on hardlands, especially those having good percentages of early starting western wheatgrass. Finally, grazing will be concentrated on the sandy plains and deep sand range sites, which have the most warm-season grasses and are best used during the summer.

The Association has employed Beryl Cramblett as range manager. He will oversee the essential continuing program of land management, help in keeping records, and supervise good animal husbandry principles.

The whole plan, meanwhile, calls for a close working partnership between local people and local, State, and national government agencies—considered by those concerned as one of the most significant aspects bearing upon the future success of this unique locally conceived Prowers County Grazing Association venture.

Fertilizer and Rest Bring Fescue Back

By Sellers G. Archer

A CONSERVATION management formula based on fertilization and a warm-weather rest period has brought Kentucky 31 tall fescue back as a successful and increasingly popular cool-season pasture grass in Alabama and other parts of the South.

The Soil Conservation Service had introduced fescue into the Alabama soil and water conservation program in the mid-1940's by sending 50 pounds—enough for 10 acres—to every county where it seemed to be adapted. It grew off well, made a large quantity of good forage, and remained green practically all year. Some hailed it for year-round pastures and an all-purpose conservation plan.

Fall-planted Ky. 31 tall fescue already protects this Marshall County, Ala., waterway by the next spring and is fenced for grazing.

Fescue and white clover mixture.

But a decade later it was losing its popularity in southern Alabama. Farmers complained that cattle did not make good gains on fescue during the hot months and that their pastures did not recover well in the fall.

The late Hal C. Graves, work unit conservationist at Atmore, Ala., was one of the many Soil Conservation Service technicians who had built a conservation program around fescue. Now Graves' fescue-based program was theaten-

The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

ed, but he did not give up easily.

First, in consultation with T. C. Mauer, SCS Washington-field agronomist for the Southeastern States, and State technicians, he tried heavy fertilization. Two tons of limestone and up to 1,000 pounds of fertilizer at planting time produced excellent fall and winter pasture, but didn't carry the grass through the summer grazing season and into the next fall.

Graves and the farmers he worked with turned to everyday horse sense to find another key for fescue success: Nature provides a rest period for every plant, they reasoned, and even though fescue stays green in the summer it is essentially a cool-season grass. They decided that they had expected too much from the new grass.

E. V. Wright, who succeeded Graves, gives this formula as a typical example of that which Graves and the farmers developed by trial and error, to put fescue back in the picture and set a pattern for good pasture management: Grass and Ladino clover are planted in October with 2 tons of lime and 1,000 pounds of 4-12-12 fertilizer. An additional 600 pounds of this fertilizer is applied each fall. Pastures are topdressed with 600 pounds of ammonium nitrate, divided into three applications in the fall and winter.

Grazing begins on established pastures in mid-October. Cattle are removed by April 15, leaving at least 6 inches of growth to accumulate food reserves in the roots to protect them from hot weather sun. Fescue gets the same management when it is used in meadow strips for a waterway, for field stripcropping, for field borders, or in a sod-based rotation. In all cases it may be an important source of pasture or hay.

The formula may vary, but the basic principles worked out in southern Alabama apply wherever fescue is grown, Maurer says. For example, in northern Arkansas where the winters are less mild, the grass is grazed in spring and fall, but not in the coldest months.

Shorthorn cattle in good fescue pasture in Mitchell County, N. C.

Agronomist A. E. Spooner of that State's Batesville Experiment Station reported finding the best grazing seasons to be mid-September to early December and from mid-March to mid-July, with rest periods in both the summer and winter. He reported 2⅓ animal units of grazing an acre for the period, a gain of about 1 pound a day per animal, and 417 pounds of gain an acre for the two seasons.

Meanwhile, farmers' experiences in the Atmore area show the success of the new fescue management formula in Alabama: W. D. Cruit wintered from 75 to 100 cows on 13 acres of fescue and gleanings from 18 acres of corn stover. R. L. Goldsmith carried two to three cows an acre on 200 acres of fescue from October 1 to April 1—and then put up more than a ton of high-quality hay to the acre.

J. Rob Williams reported that beef cattle on fescue pasture and cottonseed meal gained 100 pounds more than animals fed the same amount of meal and good hay. Fifteen acres of fescue carried 65 cows from October 1 to April 1 for Mack Carpenter. Six acres carried 20 cows for 60 days for C. M. Byrd. Mack Reed wintered 80 400-pound steers on 40 acres of fescue for 5½ months.

Have You Seen?---

- "Multiple-Purpose Watershed Projects, Under Public Law 566," by the Watershed Planning Division, Soil Conservation Service, USDA's PA-575, superseding PA-392, "Small Watershed Projects Under the Watershed Protection and Flood Prevention Act." These projects can include many purposes: Flood prevention; agricultural water management; municipal and industrial water supply, both for present and future use; and recreation and fish and wildlife developments. The pamphlet tells how to make application; develop a watershed work plan; finance, carry out, and maintain the project; and lists other available help in addition to that under Public Law 566.

- "Soil and Water Conservation in Many Countries," by Phoebe Harrison of the Soil Conservation Service, USDA Miscellaneous Publication 908. This picture booklet tells about soil and water conservation around the world.

Better Cattle Not More Cattle Is Conservation Ranchers' Goal

By Hal L. Rogers

Sprinkler system in operation. Ridges and benches in background were used in past for hay production.

QUALITY instead of numbers is the key to the Large Cattle Company's operations in central Idaho where Ben Large says "we stand the acres on edge and graze both sides."

The company, with ranch headquarters about 20 miles down the river north of Riggins, has one of the outstanding ranching operations in the Salmon River Soil Conservation District.

Conservation range management and herd improvement make it possible for Ben and his partners —brother Jim and Jim's son, Sam —to live up to their standard of better cattle instead of more cattle on their spread along U. S. Highway 95 between New Meadows and Whitebird. Although the rangeland is rough and steep, Ben will tell you "we have the best cattle country in the West here." But winter feed has been a problem for ranchers on this stretch of the Salmon River. That is why he emphasizes "we must concentrate on quality instead of numbers."

Between 9,300-foot peaks and the river, itself at 1,500 feet elevation, there are a few sloping benchlands which drop off almost vertically to the river. These benches, along with occasional large alluvial fans and gravel bars, provide the only land available to grow winter feed; and early placer mining left much of the best benchland marred by huge gullies. In fact, young Sam's grandfather, Sam Large, established ownership on an original 160 acres through a mining claim and, Ben says, wasn't interested in ranching.

His rancher sons and nephew long have recognized the need for a method of obtaining more efficient and rapid gains on their calves, and the company set out to develop a system by which they could sell more beef per cow. They have used the natural resources,

Ben Large adjusts sprinkler head on irrigated pasture from which 4 cuttings are not uncommon.

The author was formerly soil conservationist, Soil Conservation Service, Grangeville, Idaho.

conservation practices, and intensive management to get maximum production. Quality and rate of gain were improved by careful selection and breeding practices; and artificial insemination improved the quality of the cattle.

Irrigation increased the production and quality of winter feed. Land once used for hay now provides more and better spring and fall grazing, increasing the total animal units a month for the ranching unit. Commenting on the practice of some stockmen who leave cattle on range long after key forage species have been grazed down to safe levels, Ben says: "Hard on the range and doesn't do cattle any good."

Soil Conservation Service Engineer Donald Stewart designed a sprinkler system which was put into operation in 1961 on 75 acres. The ranch now produces as much hay on 75 acres as on 220 acres formerly. Instead of 1½ tons of dryland alfalfa hay, fields now produce 6 tons to the acre.

"We used to farm up to 150 acres of hayland, but we sometimes didn't get over a half a ton an acre," Ben Large said.

Cost of installing the sprinkler system, with water pumped from the river, will be offset by increased feed production in only a few years. Not only does it cost less to harvest hay from the reduced acreage, but the dryland that once was used for hay will be seeded to improved pasture species to provide for additional cows and offer more opportunities for rotation-deferred grazing on spring-fall ranges.

The Larges have leased an adjoining 1,700-acre ranch, which will be operated in connection with their own spread. With the 80 acres of irrigated hayland and more than 100 acres of dryland alfalfa-grass pasture on the second ranch, their winter feed problems will be further reduced.

Brush Control Brings Ranchers More Grass for Livestock

By Paul F. Larson, John Sampson, and Samuel F. Greenfield, Jr.

RANCHERS of the Southwest and Inter-Mountain areas in particular long have been bothered by grass-choking and water-robing brush spreading over more and more of their rangelands in the wake of heavy livestock grazing and prolonged droughts. A growing number of ranchmen now are doing something about it.

They are turning to brush control as an effective and profitable range conservation measure for the benefit of livestock and game. That is, when it is coupled with such other practices as stocking within the grassland's safe carrying capacity, deferred and rotation grazing, and more even distribution of livestock on the range through planned water and salt placement. Also, continued brush control measures may be made necessary by recurring infestation of some kinds of brush under certain climatic or other conditions.

Blue gramagrass and muhly grass begin to form protective cover on sand.

The dry rangeland brush problem exists from the Southern Great Plains to the Pacific Northwest. The National Inventory of Soil and Water Conservation Needs, made at the turn of the 1960's by the U. S. Department of Agriculture in cooperation with State and local governmental and private interests, showed the Southern Plains States of Texas and Oklahoma to have more than 28.6 million acres of this unwanted vegetation on rangelands—28.5 acres of it in Texas alone. The Mountain States were runner-up with 20.3 million acres of brush, followed by the Pacific area with about 2.3 million acres.

Representatives of the Soil Conservation Service, which had the leadership among Department agencies that helped make this first such comprehensive land and water resource study ever made, point out that many more millions of acres of brush infestation are to be found on lands classified in the inventory as woodlands but still primarily suited to grazing use.

The authors are work unit conservationist, Littlefield, Tex.; soil scientist, Brighton, Colo.; and range conservationist, Bend, Oreg.; all of the Soil Conservation Service.

This is how Montgomery pastures have changed from poor to good condition after shinnery brush control and solid grass seeding.

They estimate the uninventoried brush-infested acreage to be possibly even greater in some such woodland areas than in those classified as rangeland.

The so-called "brush" includes a variety of woody plants, distributed according to climate, soil, and other conditions. They range from shin oak, an outcast runt of the stately oak family, to the more rugged mesquite and junipers, and include in widest distribution of all sagebrush of many varieties. Allowed to spread uncontrolled, they not only shade and crowd out palatable forage plants but also rob the soil of moisture needed by the grass.

Various brush control methods have been used successfully, depending upon such factors as the kind of brush, severity of infestation, acreage to be controlled, and the landowner's or operator's facilities for carrying on a control operation. The control methods include everything from burning and reseeding to uprooting the brush with plows or other suitable equipment, and from tearing out the brush with heavy, power-drawn chains dragged over the land to spraying with special herbicides that are nontoxic to domestic animals, wild game, or birds.

Spraying, usually by airplane, often is favored by the landowners, because of the large areas that can be treated rapidly by this method. Soil Conservation Service soils and range management technicians working with western soil conservation district ranchers and farmers are called upon to supply basic information on brush control needs and sound information as to the best way of going about the job. They emphasize that, whatever control measures are used, the objective is "control"—not "eradication"—to provide more forage for livestock and wild game.

Through such conservation control methods, enough brush plants are left to give cover to game birds and animals; and the better grass stands resulting from control offer more food and cover to deer and other animals than the brush did. In its brushy condition, SCS biologists point out, much of the land provides little for game to eat, and an important goal of brush control is to subdue enough of the undesirable vegetation to improve wildlife habitat. The objective, they explain, is a "rational" brush control program—not a "scorched earth" policy.

Rangeland brush control is one of the conservation practices for which landowners may obtain Federal cost-sharing help through the Great Plains Conservation Program. Requests for increasing the amount of such money that may be earmarked for brush control are growing as the practice spreads. The experience of brothers John H. and Jim Montgomery in the Duck Creek Soil Conservation District in the rolling plains of West Texas in now growing grass where shin oak used to thrive is one of many that point up the reason for brush control popularity.

One of the Montgomery units consisted of two sections of sandy-land range in poor condition where the skin oak had gained control.

Bradbury (r.) plans sagebrush control with SCS Conservationist E. Louck (l.) and range specialist Ray Thompson.

They aerial sprayed the unit in June of 1959 to control the shin oak. The next winter, the Montgomery brothers overseeded the two sections with a native grass mixture of sand lovegrass, switchgrass, Indian grass, and side-oats grama, using their own equipment to save on costs. The two sections also were cross-fenced, and an adequate storage facility for water was built.

The brothers deferred grazing after brush control from spring until frost; and adjusted grazing during the winter months so that not more than one-half of the year's growth was removed. They have more than doubled the cattle carrying capacity of their pastureland.

Up in northeastern Colorado, rancher Tom Bradbury of Byers and Roggen is controlling brush to improve 820 acres of land he added to his ranch in 1962 to make more room for his cow herd. He started in June 1962 by spraying 450 acres of mostly sand sagebrush, weeds, and cactus with a 2-4-D low volatile ester in a diesel oil-water mixture from an airplane. A second treatment was made at the start of this year's growing season to take care of expected new growth at the base of the now dead sage bushes. Meanwhile, in spite of a dry year, grass seed heads were showing up all over the treated area.

Bradbury, who got SCS advice through the Southeast Weld Soil Conservation District, estimates he saved 60 percent on clearing costs; which average $3 an acre in the county, by drawing upon Great Plains Conservation Program cost-sharing. An SCS soil and land capability map of the ranch showed Bradbury the kinds of soils—loose and sandy and susceptible to wind erosion—on the place and their ability to produce feed and resist erosion. A range condition map showed the kinds of grasses and plants, what condition they were in, and the problem areas with more than 10 percent sage and only 5 percent of the most desirable grasses—needle and thread, prairie sand reed, and sand bluestem.

There is enough of the desirable grass, but Bradbury will keep his cattle off the sprayed area until the grasses have developed a thick stand.

Juniper trees pushed into piles with uncleared area in background on McDonald ranch near Ashwood, Oreg.

Ranchers in the Trout Creek Soil Conservation District in Jefferson County, Oreg., are in the midst of clearing 200,000 acres of juniper, which since 1900 has moved from the rocky south slopes, ridges, and dry canyons and invaded once good bunchgrass range. They have cleared approximately 4,000 acres with bulldozer and power saw since 1958. Use of chemicals has not proved satisfactory in this area.

There is an estimated 1½ million acres of the juniper forest type in Oregon. Ring counts show that most juniper stands in Jefferson County, at least, are less than 70 years old. SCS technicians estimate a heavy stand will shade out 30 to 50 percent of the ground surface at noon, and also rob grass of moisture and plant food. Recent range surveys showed native bunch-grasses formerly produced 1,000 to 1,300 pounds of dry forage to the acre on Tub soils range in good condition, compared to less than 200 pounds today on juniper infested lands; and ranchers find they can get yields of 1,500 to 2,500 pounds of feed an acre by seeding to improved grasses.

Trout Creek ranchers are drawing upon Agricultural Conservation Program cost-share funds for the approximately $20 an acre cost for clearing juniper—a cost they expect to see paid back with good interest. Clearing contractor Tom McDonald, for example, reports getting a week's feed for his sheep on cleared range where he formerly got but 2 days' feed; and cheatgrass now grows 10 to 14 inches high instead of the 4 to 6 inches on uncleared land.

The juniper is cleared in summer and fall, piled and later burned; and grass is seeded in the freshly disturbed soil before the next growing season. The Trout Creek district bought a heavy-duty rangeland drill designed by the U. S. Forest Service to seed such unprepared seedbeds. Among others who are fighting the juniper, which prefers the best soils and rangeland with a high forage potential, are Aaron Hale, who has lived on his Trout Creek ranch for 78 years; Willis Nartz, Charles Keegan, Brick Bannon, and Tom McDonald. They figure they have no other choice.

"Grass Farm" Is Model For Best Use of Kansas Lands

By Fred C. Gleue

THE sign says: "Grass Farm —Take Half-mile Side Trip at Your Own Risk—Travel by Horse, Car, Camel."

A lot of visitors are taking the invitation at its word. They are taking a look at the 17-acre grass plot—mainly by auto, of course.

The "farm" is the work of the Republic County (Kans.) Soil Conservation District. The Soil Conservation Service staff at Belleville lent a hand.

The farm, between a trading post which sells souvenirs and a city-maintained display of buffalo and other wild animals, is a tourist attraction in its own right. A leaflet explains to visitors the uses and characteristics of the various grass species. The slopes range from 5 to 20 percent. The area had been cultivated for 50 years.

Eight varieties of grass are growing on the acreage, formerly a sloping patch severely notched by gullies. All of the grasses—some in rows and on the contour—are flourishing. They are a silent message from the district: land like this has a safe and profitable use with conservation treatment.

There are 40,000 acres of that kind of land in the district, suited to grass rather than to the usual corn and milo. It could be highly productive, the district board wants people to know, if in properly planted and managed grass.

The board of supervisors of the Republic County district put in the farm in 1957. It leased the land for 10 years from the city of Scandia, for a nominal annual fee.

The grass varieties are big bluestem, little bluestem, Indian grass, switchgrass, side-oats grama, Caucasian bluestem, sand lovegrass, and western wheatgrass. The district supervisors agreed on the grass farm idea to show farmers and others what can be done with grass on this type of Class IV land—that native grasses can be established successfully with known methods. They wanted viewers to see the different grasses side by side. They also wanted to show how grass seed can be harvested for added income or to plant more grass acreage.

SCD Supervisor Glenwood Freed (r.) and author by grass farm sign at Scandia, Kans.

When the farm was established, Glenwood Freed was board chairman. His interest and effort contributed a lot to the venture's success. The board members all pitched in to mow, cultivate, spray, harvest, and market. They got 100 pounds of switchgrass seed an acre the first year. They harvested 300 pounds of Indian grass.

Once each year, the district supervisors gather at the farm to evaluate their efforts and to talk over new plans. Soil Conservation Service men keep a close check on the plantings. In their daily work, they also often suggest to landowners and operators that they have a look at the place.

The board members admit that

Field of Blackwell switchgrass being examined for seed development.

Note:—The author is work unit conservationist, Soil Conservation Service, Belleville, Kans.

you can't easily put a value on the results of the grass work. They do know, though, that there is much of that kind of land in Kansas and in other States of the Great Plains. Grass like that, with conservation use, would mean permanent production and profitable income from such acreages.

Kansas has 18 million acres of grassland within its borders. It is a vastly important asset to the people of the State. The Republic County district board thinks its display of strong, high-producing native grasses can help to get a lot of Sunflower State farmers and ranchers to appreciate their value.

California Farmer Finds Grass Crops Beat Wheat

By Ed Anderson

DIRECTOR Victor Stuart of the Montague Water Conservation District and the Shasta Valley Soil Conservation District is helping to write a new chapter of grass-and-livestock farming in the up-and-down story of northern California's Shasta Valley agriculture.

Conservation practices have figured in conversion of Stuart's former wheat ranch to a largely hay, pasture, and cattle operation. Wheat now plays a minor role in his crop rotation system. The change has nearly tripled gross income on one part of the 500-acre ranch.

Son of a row crop farmer in Ventura County in the southern part of the State, Stuart got his first glimpse of Siskiyou County about 1927 while following the crops as a harvest hand from California to Washington.

"The first time I saw this area I didn't think much of it," Stuart now admits—but 20 years later he not only had changed his mind but was farming there.

That was after he had visited Siskiyou County again, on a hunting trip following a World War II hitch with the armed forces, and saw an opportunity to enjoy more elbow room than in crowded Riverside County where he earlier had settled as a house painter. He moved his wife and small daughter north in 1947. The land they bought in the Montague area didn't even have a house or well on it. Theirs was a 20th century version of pioneering, in an area steeped in the tradition of post-gold rush days.

Barley, oats, wheat, hay, and livestock have figured in the area's economy since the first farmers broke ground in the 1850's. Stuart's farm lies in a 12- to 14-inch rainfall area. It includes some irrigated Class III and IV land. Dryland is Class IV.

Stuart discovered, as many another grain farmer, that it takes a lot of land to support the farm machinery needed today—more land than he could put into production. He converted some of his land from grain to alfalfa the first year, and has continued the conversion ever since. He now has 129 acres of irrigated pasture.

When local farmers and ranchers voted in the Shasta Valley Soil

Stuart looks over part of the acreage he has converted from wheat to hay and pasture for beef on his 500-acre ranch.

The author is work unit conservationist, Soil Conservation Service, Yreka, Calif.

Irrigation water storage pond on Stuart's ranch doubles as wildlife habitat.

Conservation District in 1953, Stuart was named one of its directors and has continued on the board since. With the help of Soil Conservation Service technicians working with the district, he developed a basic conservation farm plan.

In 1955, he leveled 40 acres and planted them to irrigated pasture. Because the irrigation water delivered on a 21-day cycle was too long a period for irrigated pasture, Stuart built a farm pond to hold some of the "ditch water," and thus was able to irrigate on a shorter cycle.

The 48-acre-foot reservoir also has attracted waterfowl, some birds even nesting there. Wildlife habitat was further enhanced by planting a multiflora rose hedgerow near the reservoir. A number of sportsmen lease hunting rights from Stuart each year for ducks and pheasants.

Stuart, meanwhile, has converted some of his land to irrigate alfalfa and Greenar wheatgrass. The alfalfa and grass are cut for hay, and then the alfalfa is left for a seed crop. Through the Conservation Reserve Program, he diverted 185 acres of Class IV land from wheat to Greenar wheatgrass and alfalfa in alternate rows. He plans to keep this land in permanent cover. He also plans to convert another 135 acres of native grassland to the alfalfa and grass combination in alternate rows. He plants only 52 acres of wheat as a rotation crop with his pastures.

Some of Stuart's Class IV land was underlain with hardpan at 10 to 20 inches. By subsoiling about 107 acres to a depth of 30 inches, at a cost of $18 an acre, he increased his yield of alfalfa and grass to 2½ tons of hay an acre on the first cutting. Another 20 acres was too wet part of the year because of poor drainage. A new ditch installed by Stuart not only drained the area but also provided supplemental irrigation water.

For the present, Stuart is content to "board" cattle, receiving so much a head for running them through the growth period on his lush irrigated pasture. The pasture contains alta fescue, Alsike clover, and birdsfoot trefoil. Last year he took in 100 cows with 400-pound calves, but figures he could handle up to 250 cattle all together.

Stuart tells how all this change has paid off:

"My first cutting of alfalfa yielded 2½ tons an acre; the alfalfa seed I grew on top of that went 300 pounds an acre. I grossed $135 an acre. Then, I can graze it for pasture and get more income from that. Wheat used to bring in about $50 an acre."

Ponies—Grass Seed—*And Conservation*

By Lyman E. Ellsbury

THE Paul Etheridge farm 6 miles west of Ralston, Wyo., has two claims to distinction: It is home for one of the largest herds of Shetland ponies in the West, and all of its cultivated acreage is used to grow certified grass seed.

The Etheridge Shetlands are famous and now number 170 head, including 65 brood mares and 5 stallions. Two registered stallions, "Nugget" and "Wildfire," have taken champion and grand champion awards at fairs and horse shows in Wyoming and Montana.

Etheridge, a veteran of World War II, and his wife, Eileen, homesteaded their unit on the Heart Mountain Reclamation Project in 1950. In 1952, he became a cooperator with the Cody Soil and Water Conservation District, and by 1956 developed a complete conservation plan that included drastic changes in land use in addition to the usual conservation practices.

Etheridge had become dissatisfied with the heavy cost of raising beans, seed peas, and alfalfa. Wind erosion was also a problem on his harvested fields. The Soil Conservation Service suggested he try

Etheridge parts radish leaves to show new grass seedings showing in this nurse crop.

The author is work unit conservationist, Soil Conservation Service, Cody, Wyo.

Etheridge shows off "Wildfire," one of the at least 5 pony stallions he keeps.

grass seed production as a cash crop and a deterrant to wind erosion.

In 1956, Etheridge planted 19 acres of Amur intermediate wheatgrass. When it started producing seed, the Great Plains Conservation Program was increasing the demand for grass seed, and Etheridge had a good market. In addition, he found that the few head of Shetland ponies which he then owned did well on the grass fields after the seed was harvested.

"I've always been fond of Shetlands," Etheridge says. "I decided this would be a good combination—ponies and grass seed."

During the next few years, he seeded more land to grass and acquired more ponies. As the conversion from cropland progressed, Etheridge worked closely with the Cody district to improve his irrigation system. The Park County Agricultural Stabilization and Conservation Committee shared the cost of installing needed concrete ditch lining and water control structures.

In 5 years, Etheridge converted 297 of his 317 irrigated acres from cropland to grass seed, pasture, and hayland. Only 20 acres are presently being used for other crop production. Certified grass seed is being produced on 126 acres.

Most of Etheridge's grass is seeded with radishes as a companion crop. The radish seed mixed with grass seed in the drill box facilitates the even flow of seed through the drill. The quick emergence of radishes after seeding soon makes the rows visible for early cultivation and irrigation. Radish seed is harvested late in the fall and provides a good cash crop from the field the first year.

Species of grass seed produced on the Etheridge farm include Amur intermediate wheatgrass, Whitmar wheatgrass, Sodar streambank wheatgrass, slender wheatgrass, and green needlegrass.

Yields average about 250 to 300 pounds an acre of Sodar wheatgrass seed and about 450 pounds of Amur wheatgrass. His slender wheatgrass, which reaches full production in its second year, has yielded as high as 700 pounds of clean seed to the acre. Etheridge also has planted green needlegrass seed obtained from the Soil Conservation Service Plant Materials Center at Bridger, Mont.

"One of the essentials for good seed yields," he says, "is the use of commercial fertilizer. I apply 40 pounds of available nitrogen an acre the year I seed the grass; the second year, I apply 90 pounds of nitrogen and then 180 pounds of nitrogen each year."

Three irrigations are needed to produce a seed crop. The fields are irrigated again after seed harvest to stimulate growth for fall pasture. The straw is baled for hay.

Etheridge explains why he is completely satisfied with his present operation: "Why shouldn't I be? I use less equipment, less labor, less water, have less risks; and, best of all, I am making more money than I ever did with the old cropping system."

This seed production field of Amur intermediate wheatgrass was the first Etheridge planted, in 1956.

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Cover Crop Seeding From the Air

Farmers cooperating with Ohio's Divide Soil and Water Conservation District have set new record in cover cropping in the Crawford County area by aerial seeding of Italian ryegrass. Chairman Clifford Hoover of the district board says the use of cover crops is now a key conservation practice as farmers strive to improve soil tilth and control soil erosion.

Left: Contractor-pilot Don McGinnis of Bowling Green uses a specially equipped airplane to seed 168 acres of corn to ryegrass within 3 hours on James E. Huggins' "Blue Goose" farm in Dallas township. Carrying 400 pounds of seed, he applied about 20 pounds to the acre. At the same time, Farm Operator Robert Dunn with a tractor equipped with a conventional cyclone-type seeder seeded 50 acres of corn at the last cultivation. Promising stands resulted from both methods. Huggins resorted to the aerial seeding when his corn grew too fast in 1962 to permit use of conventional seeding methods at the last cultivation.

Right: Edward Burger of Tiro checks an excellent rye grain seeding made the fall before by plane in his 50-acre cornfield. Burger had acted as flagman, while W. W. Snyder of Fostoria seeded a strip 10 corn rows wide at each flight across the field. Snyder seeded 25 acres an hour, applying 1½ bushels an acre.

Photo picture story by Robert H. Mills, work unit conservationist, Soil Conservation Service, Mansfield, Ohio.